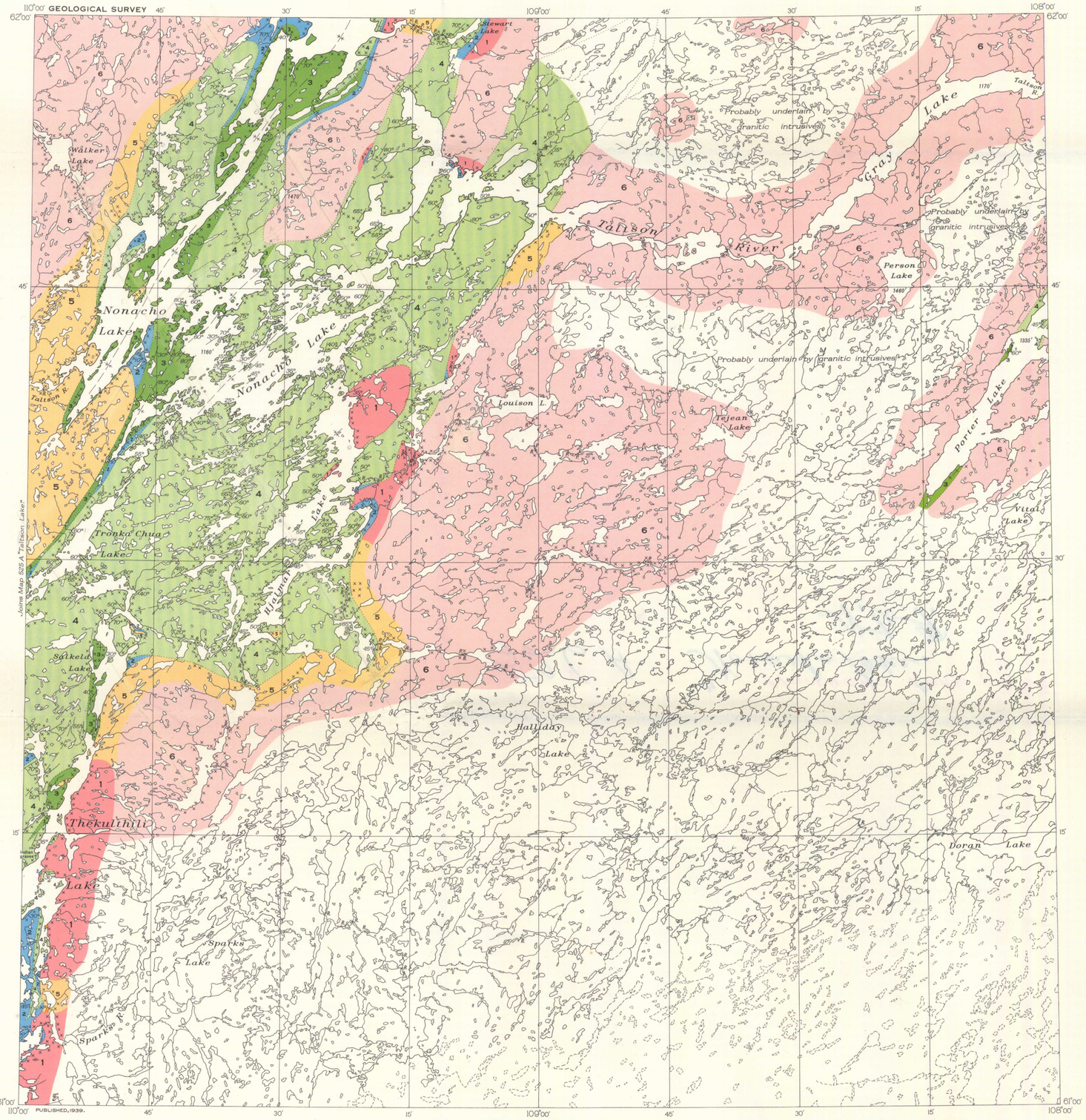
CANADA

DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY




Joins Map 525 A "Taltson Lake"

## LEGEND

**PROTEROZOIC (LATE PRE-CAMBRIAN)**

**POST-NONACHO**

- 7 — Diabase
- 5 — Granite, granodiorite and allied rocks

**NONACHO SERIES**

- 4 — Arkose, quartzite; some slate, greywacke and conglomerate
- 3 — Slate, greywacke; some arkose and quartzite
- 2 — Conglomerate; some arkose and quartzite
- 6 — Granite, granodiorite and allied rocks; age relative to Nonacho series unknown

**ARCHEAN (EARLY PRE-CAMBRIAN)**

- 1 — Granite, granodiorite and allied rocks

Geological boundary (defined, assumed)

Bedding (inclined, vertical, horizontal)

Synclinal axis

Rock outcrop where observed

Portage

Lake and stream (position approximate)

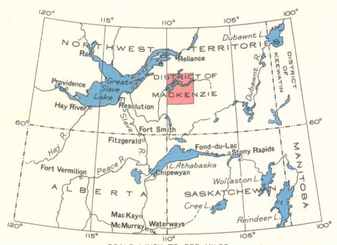
Rapids

Marsh

Height in feet above Mean sea-level ... 1180'

Geology by J. F. Henderson, 1936.

Base-map compiled by the Topographical Survey, 1938, from aerial photographs taken by the Royal Canadian Air Force. Cartography by the Drafting and Reproducing Division, 1939.




SCALE, 1 INCH TO 200 MILES

PUBLISHED, 1939.

MAP 526A

# NONACHO LAKE

DISTRICT OF MACKENZIE

NORTHWEST TERRITORIES

Scale, 1/253440 or 1 Inch to 4 Miles

Approximate magnetic declination, 32° to 36° East.

## ACCESS

The area may be reached by canoe from Fitzgerald on Slave river by way of Leland lake and Taltson river or from Camsell Portage on Lake Athabaska by way of Tazin and Thekulthili rivers. The route from Lake Athabaska is the easier but both routes are difficult and include many portages. The area may be reached by airplane from Lake Athabaska or Fitzgerald in a little more than one hour.

## PHYSICAL FEATURES

The country is plain-like presenting an even skyline when viewed from the air or from the tops of the higher hills. In detail however, the topography is extremely rugged with rough, rocky hills rising precipitously from muskeg or lake to elevations of 200 to 300 feet. The bedrock of the western half of the area has been swept clean of overburden by glaciation and with the exception of small swampy areas the surface is almost continuous rock outcrops. East and northeast of Nonacho lake, sand plains and eskers cover much of the bedrock and east of Hjalmar lake rock outcrops are scarce due to extensive sand plains, eskers, and boulder morainal deposits. All the country is well wooded but the trees, for the most part, are small and stunted.

## GENERAL GEOLOGY

The oldest rocks within the area are the pre-Nonacho group of granitic intrusives (1). They are, in general, light grey to pink, medium to coarse-grained rocks with granitic texture and a quartz content of from 15 to 30 per cent. They vary in composition from granite to granodiorite with local more basic facies. They cannot be differentiated with certainty from the younger, post-Nonacho granitic group except along and near contacts with the Nonacho sediments where their relations with the sediments can be observed.

The Nonacho sediments (2, 3, and 4) rest unconformably on the older group of granitic intrusives. They are composed of conglomerate, slate, greywacke, arkose and quartzite. One type grades into another and beds and lenses of conglomerate and of slate occur interbedded with arkose and quartzite. The conglomerate (2) occurs at or near the base of the series and is rarely absent where the sediments lie on the older granites. In general the conglomerate is several hundred feet thick and in places has a thickness of at least 2,000 feet. On and near Thekulthili lake the greater part of the conglomerate consists of closely packed, well rounded pebbles varying from 1 to 6 inches in diameter. Granite, granite-gneiss and vein quartz make up 50 to 60 per cent of the pebbles. The remaining 40 to 50 per cent is largely of fine to medium-grained, grey to buff weathering, impure quartzites with a smaller proportion of fine-grained, red to purple weathering quartzites. The matrix is a medium to rather coarse-grained arkose or arkosic quartzite. Sandy, crossbedded, arkosic beds and lenses from a few inches to several feet in thickness are numerous throughout the conglomerate. The conglomerate occurring to the north of Thekulthili lake is characterized by the almost total absence of pebbles other than of granite and allied rocks. Near the base this type of conglomerate consists of closely packed, angular, granite fragments from 1 to 2 feet in diameter in an arkosic matrix composed in large part of small granite fragments.

The slates and greywackes (3) are fine to medium-grained, dark grey to black weathering rocks. The weathered surface along the lake shores is rough and pitted due to the weathering out of the less resistant beds and lenses. Much of the slate contains lenses of arkose from a fraction of an inch to 3 to 4 feet in thickness. Much material, classed as greywacke, is intermediate in composition and grain size between the arkose and slate. Crossbedding is common in the sandy lenses and ripple marks are well developed, usually on the top side of sandy beds overlain by fine muds or silts. Near contacts with intrusive granite the slates have been altered to light coloured, silvery phyllites and fine micaceous schists injected along the planes of schistosity by many small quartz veinlets which, as the granite is approached, become pegmatitic.

The arkoses and quartzites (4) are buff, yellow, and light grey weathering rocks of fine to medium-grain. In general the beds are massive and several feet in thickness occur interbedded with the massive arkose and quartzite. The arkose and quartzite contains many isolated pebbles of granite and vein quartz. Lenses and irregular pocket-like masses of conglomerate are also abundant. The lenses tend to be developed most abundantly along certain horizons. Crossbedding, ripple marks and gradation in grain size are characteristic of the arkose and quartzite throughout. Many of the argillaceous beds show mud cracks filled with sandy material. Intraformational conglomerates or breccias have been widely developed by the breaking up and jumbling together of partly consolidated and cracked, argillaceous beds and the incorporation of the fragments in the overlying nearly contemporaneous sandy beds. Near contacts with the younger granite the quartzites and arkoses have been baked to fine-grained, somewhat glassy, pink rocks. The baked quartzite is most abundant around and to the northwest of the small granite body northeast of Salkeld lake. The rock weathers bright pink as compared with the sombre buffs and greys of the unaltered quartzites and arkoses.

The conglomerates, arkoses, and quartzites lie in a series of open, gently plunging folds except within the northwestern part of Nonacho lake where the folding is closer and the beds, in places, are overturned. The dip of the beds on the limbs of the folds varies from 45 to 60 degrees, but steeper dips up to 80 degrees are not uncommon. Within the wide troughs of the larger synclines such as the Nonacho and Hjalmar Lake synclines the dips vary from almost nothing to 45 degrees. The folds within the slates and greywackes, in contrast to the open folds within the arkoses and quartzites, are closely compressed. As a consequence the prevailing dip of the beds is steep to vertical.

The Nonacho sediments may be correlatives of the Beaverlodge series of Lake Athabaska and the lower part of the Great Slave group of Great Slave lake.

The younger group of granites (5) resemble the older group of granites; they are light grey to pink weathering, medium to coarse-grained, rocks with a granitic texture and a quartz content of 15 to 30 per cent.

Dark grey basic dykes (7), generally showing diabasic texture and ranging in composition from diorite to gabbro, cut the Nonacho sediments and granite of both ages. Near Thekulthili lake the dykes are fairly numerous and several more than 100 feet in width were observed. North of Nonacho lake they are not plentiful and few of those observed exceed 15 feet in width.

## ECONOMIC GEOLOGY

Very little of the Nonacho area has been prospected and no deposits of economic importance have so far been found. The sediments are probably the most favourable host rocks but the possibility of finding gold-bearing veins near the borders of the younger granite and within the older granitic rocks should not be overlooked. Quartz veins are numerous in the sediments. Those that contain sulphides usually occur near contacts with the younger granite. The most common sulphides in the veins are pyrite, chalcopyrite and galena.



526 A